

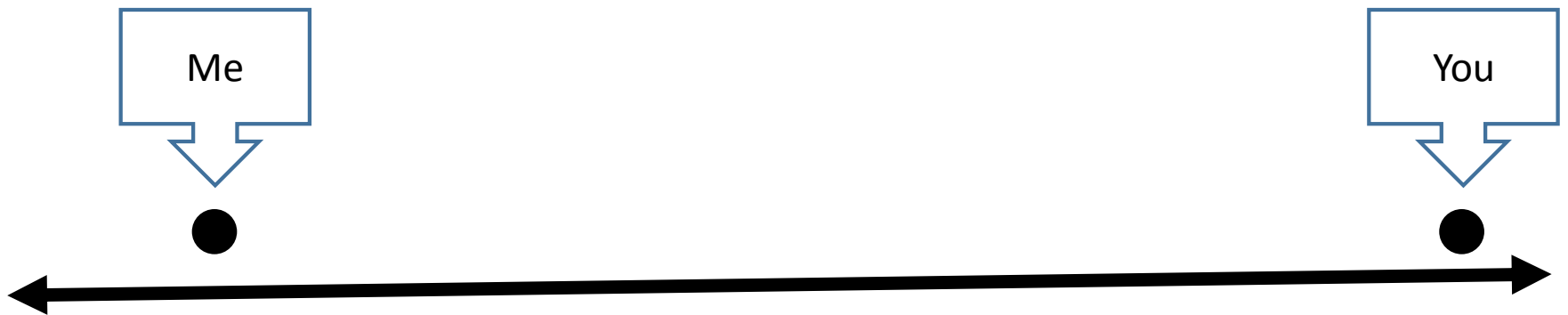
The limits of formalism

Raph Koster

The limits of ~~formalism~~

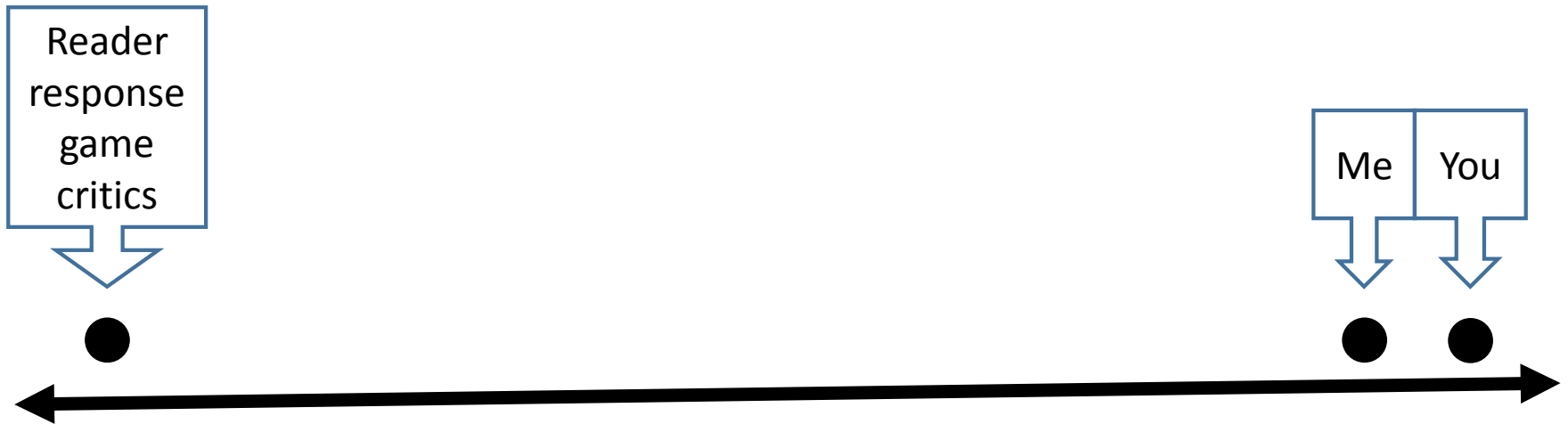
I hate this word.

I have spent much of the conference feeling a large gap:

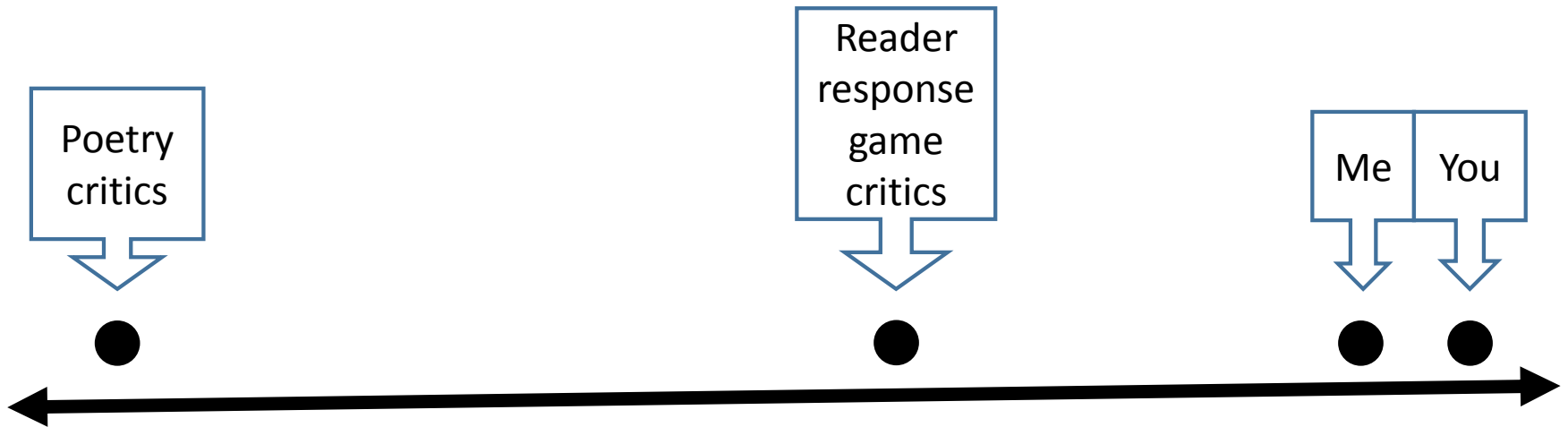


(I don't even know calculus).

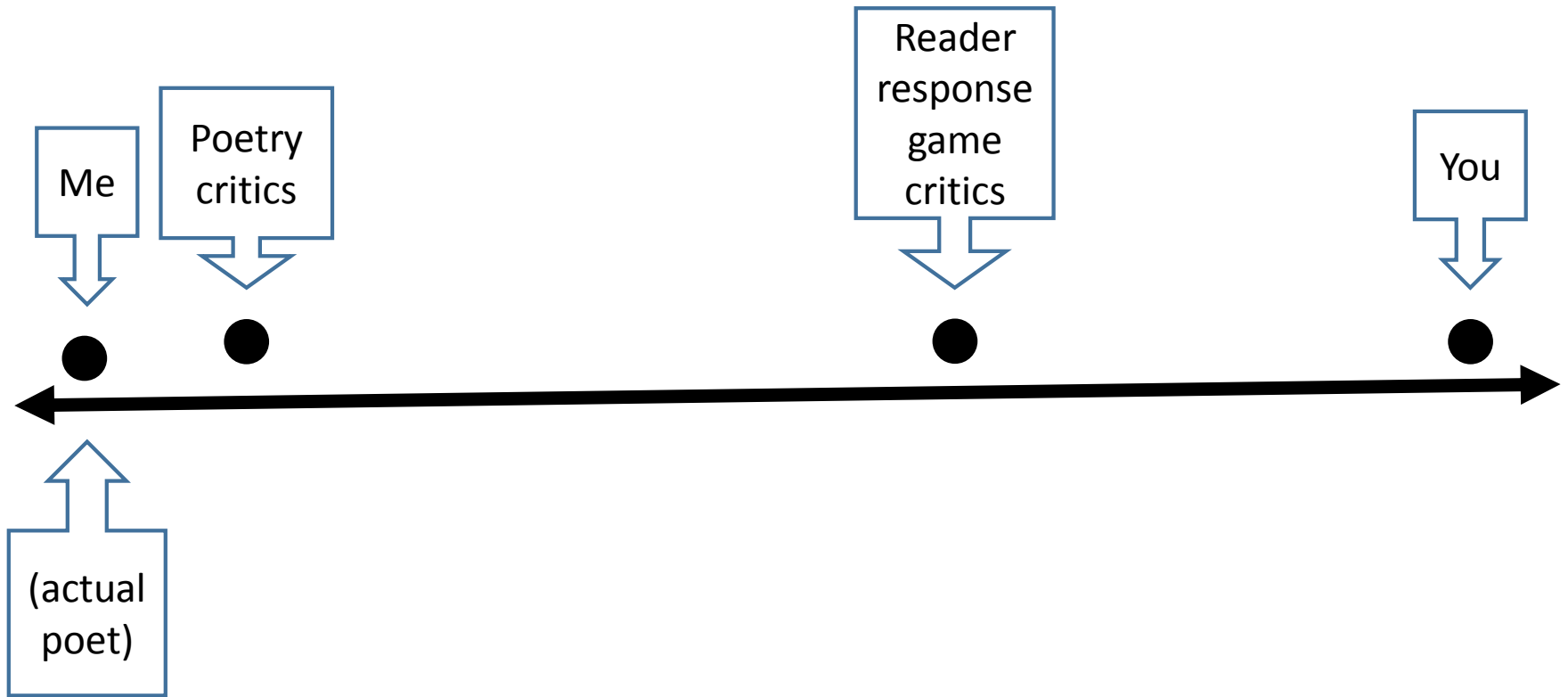
But we shouldn't forget that...

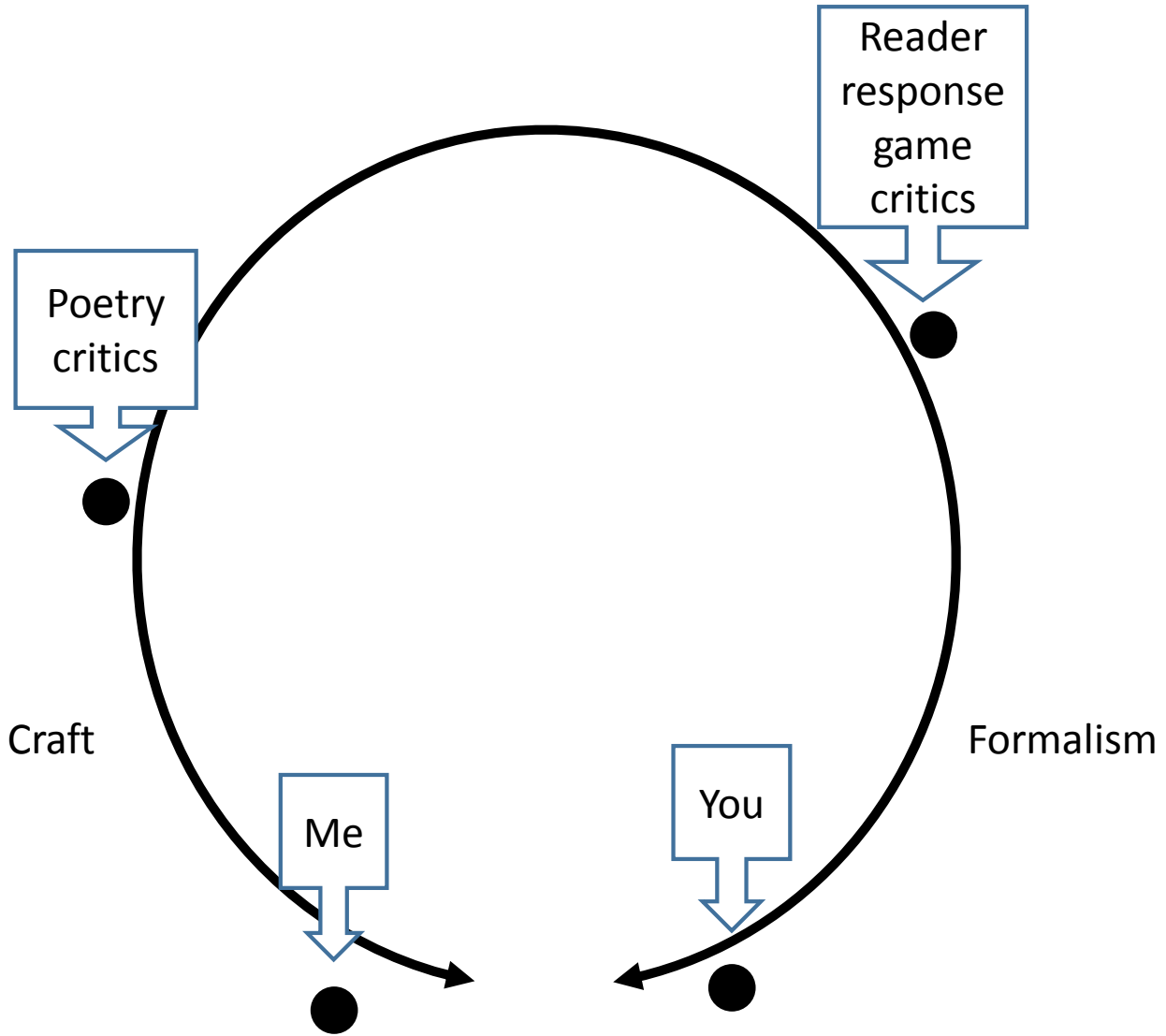


Oh, and by the way...



Especially since...





What leverage does a formalist approach give you?

- Access to a suite of conceptual models that allow transformation of familiar patterns into fresh domains, thereby permitting both robust solutions to extant problems and the generation of new problems.

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- Access to a suite of conceptual models that allow transformation of familiar patterns into fresh domains, thereby permitting both robust solutions to extant problems and the generation of new problems.
- I want your work to give me tools so that I can play the game design game the way Steph Curry plays basketball.

What might it leave out?

- Rich models may fail to provide human-readable heuristics, ontologies, or indeed any outputs **whatsoever** (other than a paper and tenure)
- Numerous aspects of the larger design space are open problems in computational modeling, and may even be intractable.

What might it leave out?

- Rich models may fail to provide human-readable heuristics, ontologies, or indeed any outputs whatsoever.
- Numerous aspects of the larger design space are open problems in computational modeling, and may even be intractable.
- I took Physics for Poets when I was in college. We need computational modeling for poets, here.

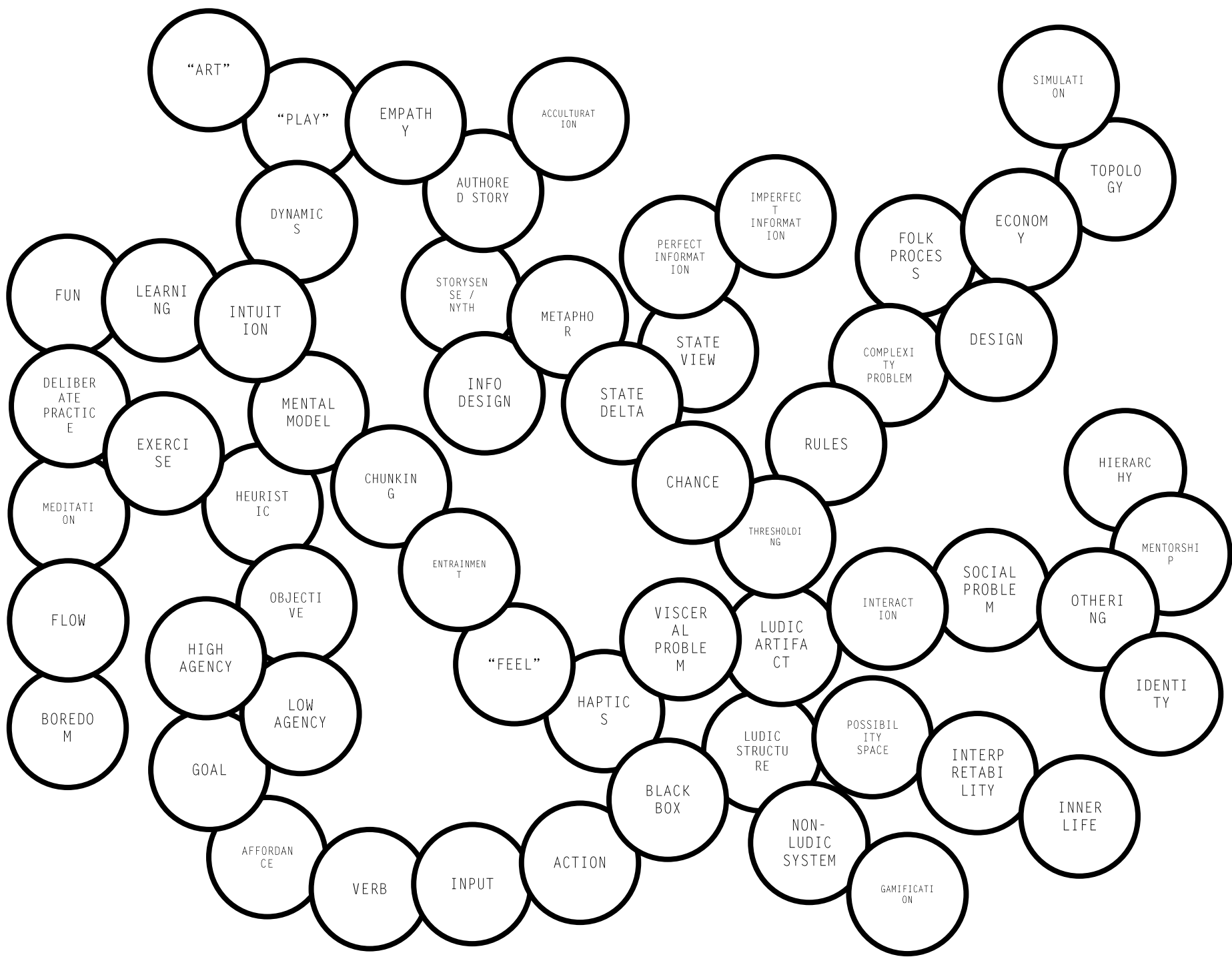
What might it leave out?

- Rich models may fail to provide human-readable heuristics, ontologies, or indeed any outputs whatsoever.
- Numerous aspects of the larger design space are open problems in computational modeling, and may even be intractable.
- I took Physics for Poets when I was in college. We need computational modeling for poets, here.
- Plus, you're not very good poets.

What are the broad contours of the landscape of formalist game theories?

What are the broad contours of the landscape of formalist game theories?

- I have no idea! Sounds to me like PCG, complexity, AI and deep learning, and more PCG.
- But I can tell you about the broad contours of the landscape of CRAFT theories.



MDA

“ART”

“PLAY”

EMPATHY

ACCULTURATION

SIMULATION

TOPOLOGY

DYNAMICS

AUTHORED STORY

PERFECT INFORMATION

IMPERFECT INFORMATION

FOLK PROCESSES

ECONOMY

FUN

LEARNING

INTUITION

STORYSENSE / NYTH

METAPHOR

STATE VIEW

COMPLEXITY PROBLEM

DESIGN

DELIBERATE PRACTICE

EXERCISE

MENTAL MODEL

INFO DESIGN

STATE DELTA

RULES

HIERARCHY

MEDITATION

HEURISTIC

CHUNKING

CHANCE

THRESHOLDING

MENTORSHIP

OBJECTIVE

ENTRAINMENT

VISCERAL PROBLEM

INTERACTION

SOCIAL PROBLEM

FLOW

HIGH AGENCY

LOW AGENCY

“FEEL”

HAPTICS

LUDIC ARTIFACT

OTHERING

BOREDOM

GOAL

BLACK BOX

LUDIC STRUCTURE

POSSIBILITY SPACE

IDENTITY

AFFORDANCE

VERB

INPUT

ACTION

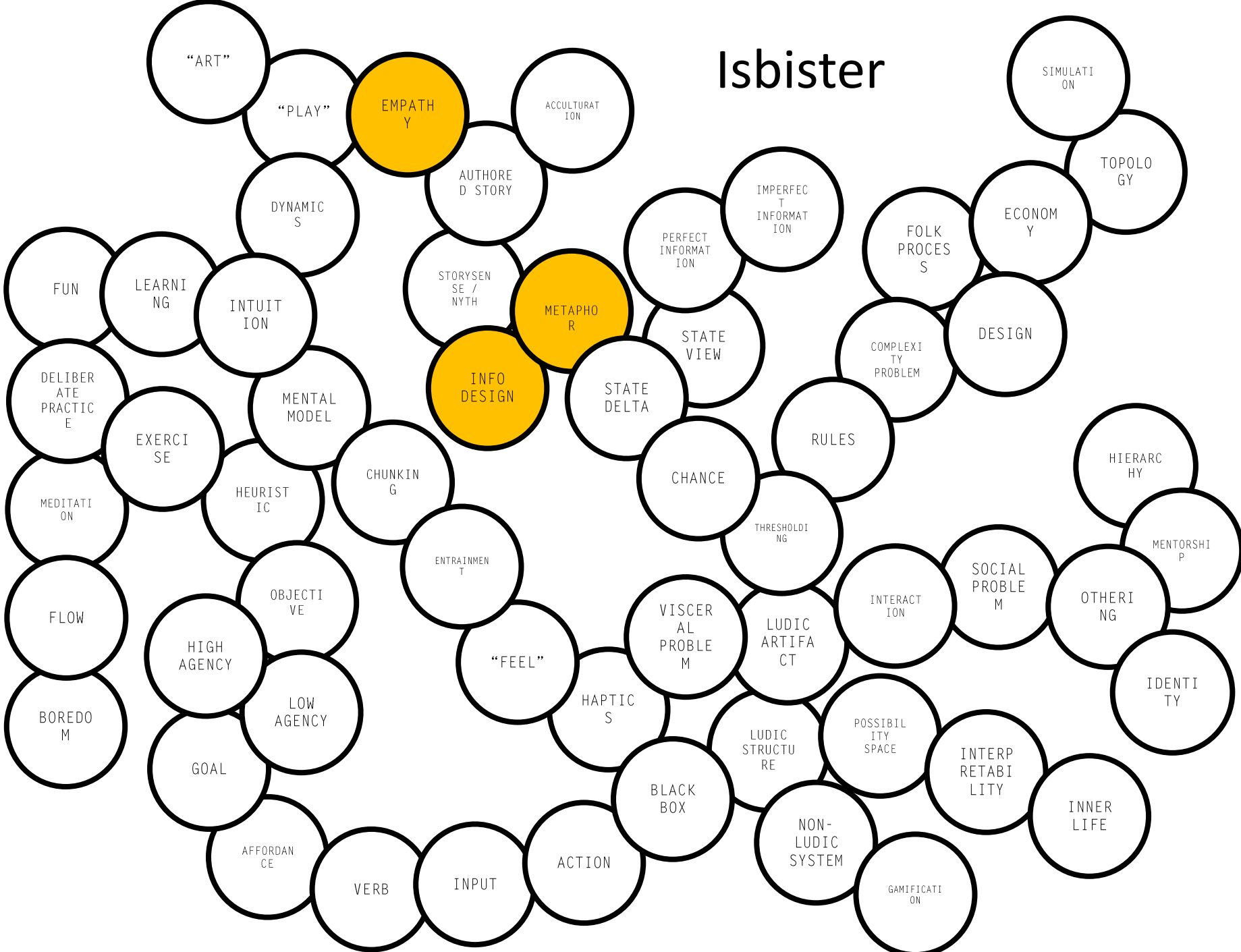
NON-LUDIC SYSTEM

INTERRETABILITY

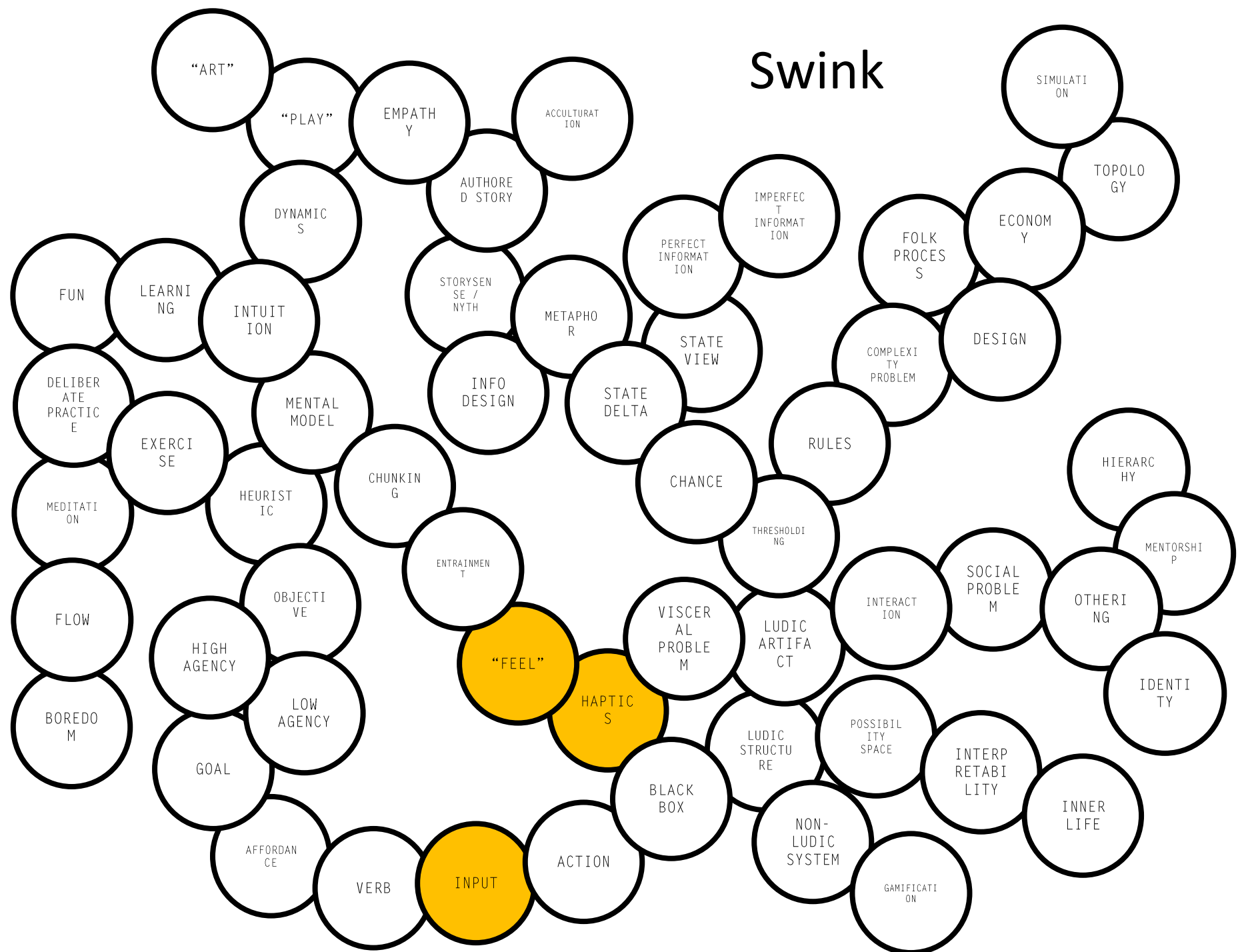
INNER LIFE

GAMIFICATION

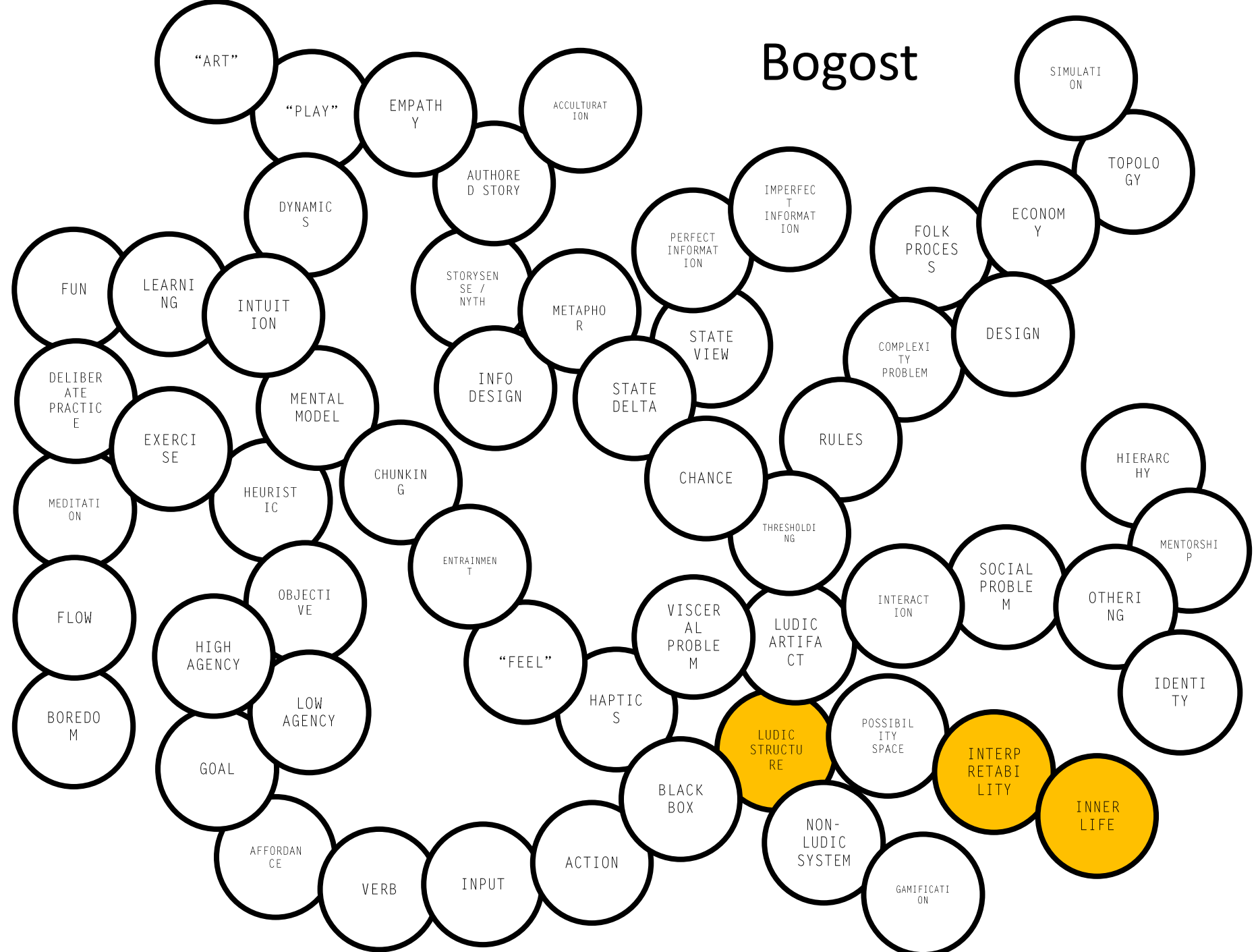
Isbister



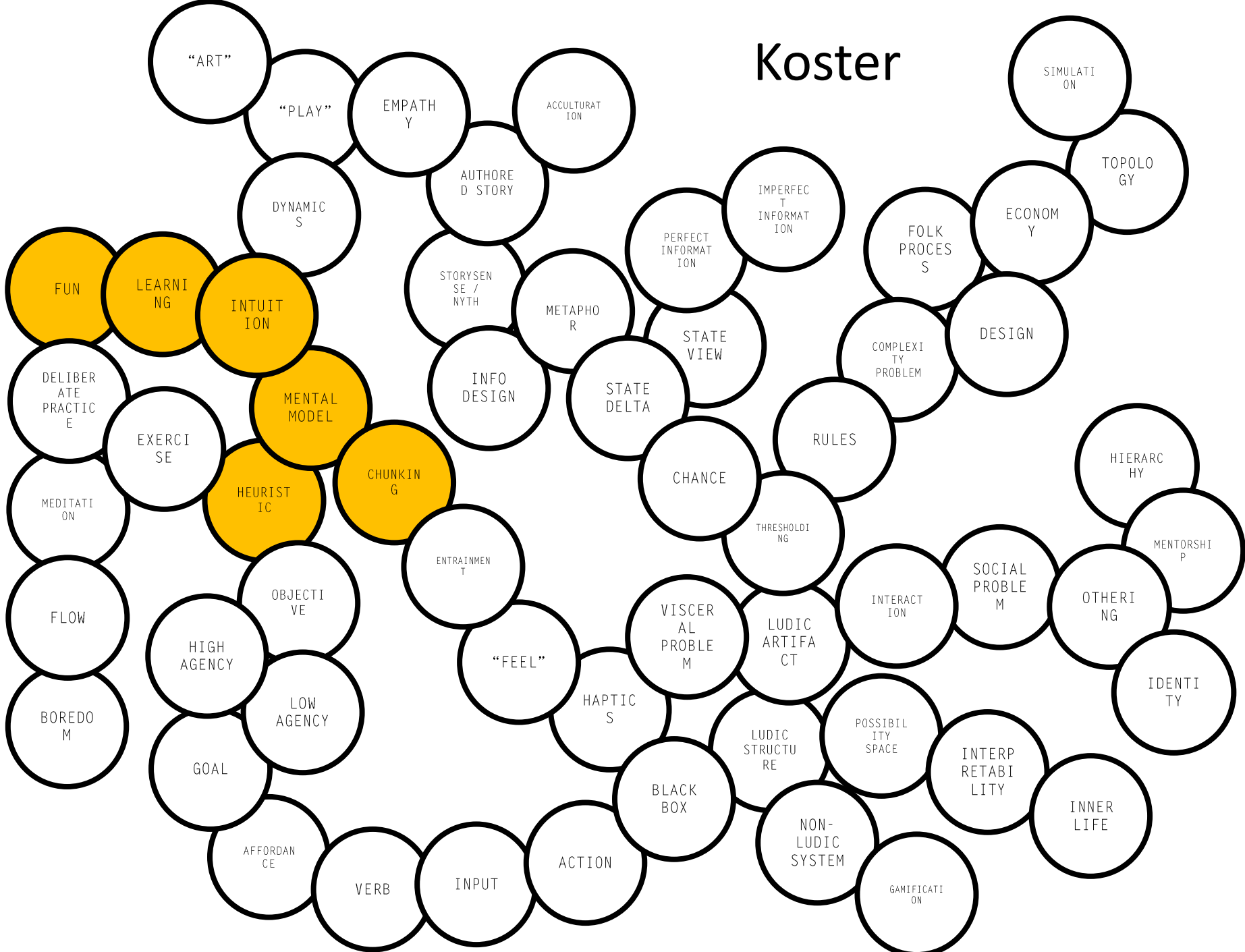
Swink



Bogost



Koster



You

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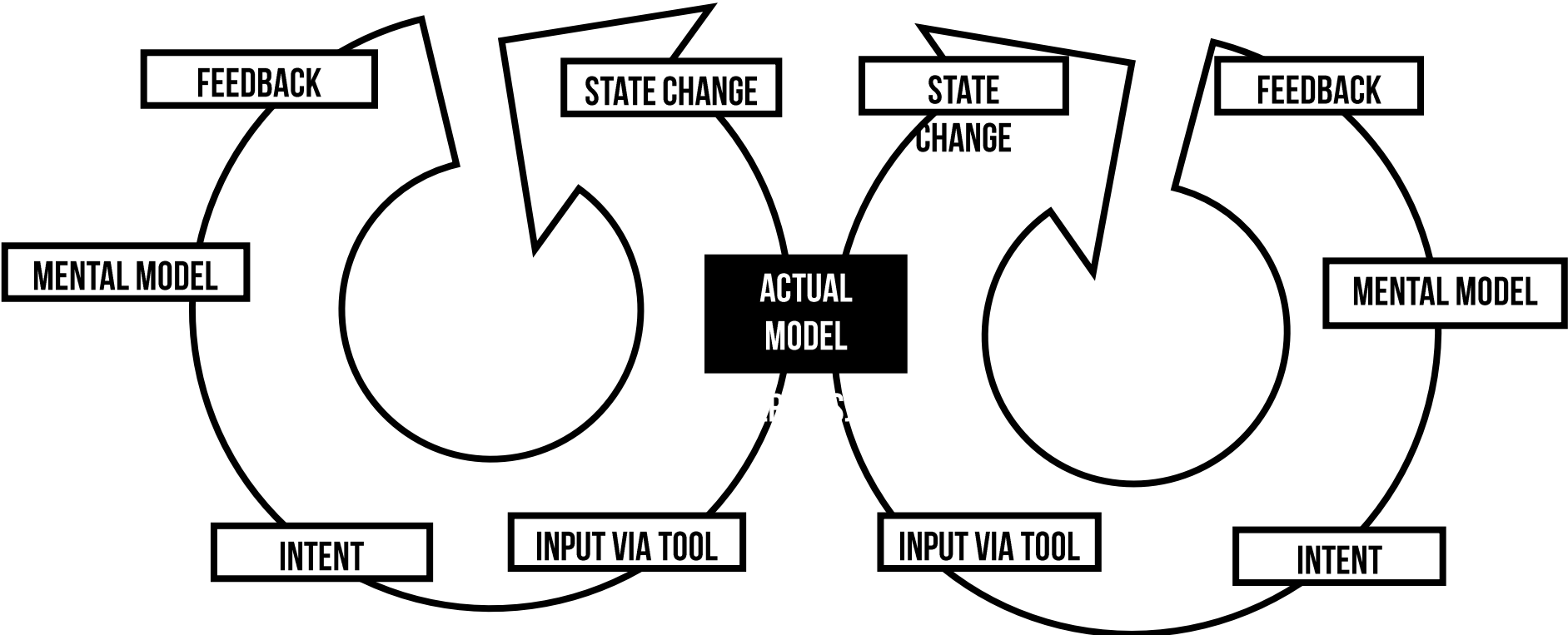
ACTION

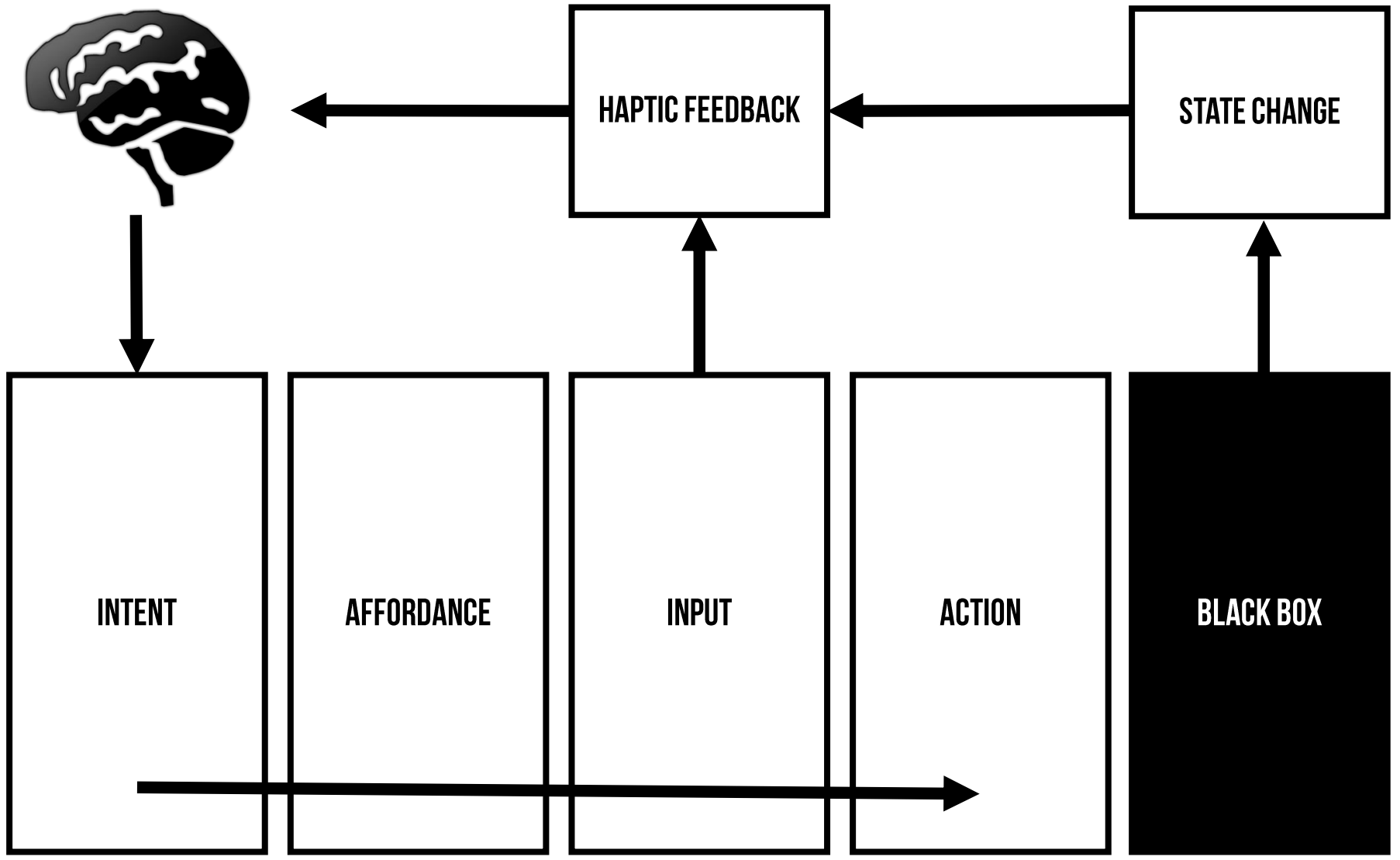
BLACK BOX

NON-LUDIC SYSTEM

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**MASTERING ONE'S OWN
PHYSICAL REACTIONS**

**MASTERING SYSTEMIC WEBS
OF RELATIONSHIPS**

**MASTERING SOCIAL
SITUATIONS**

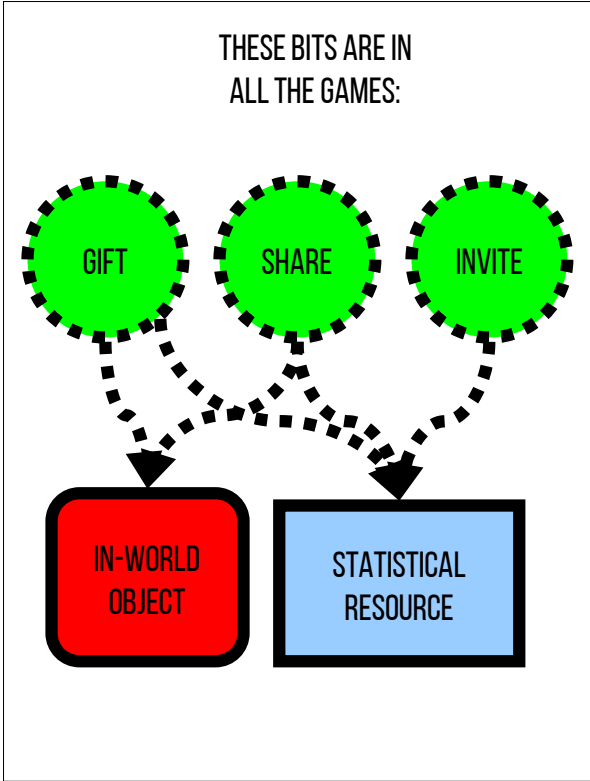
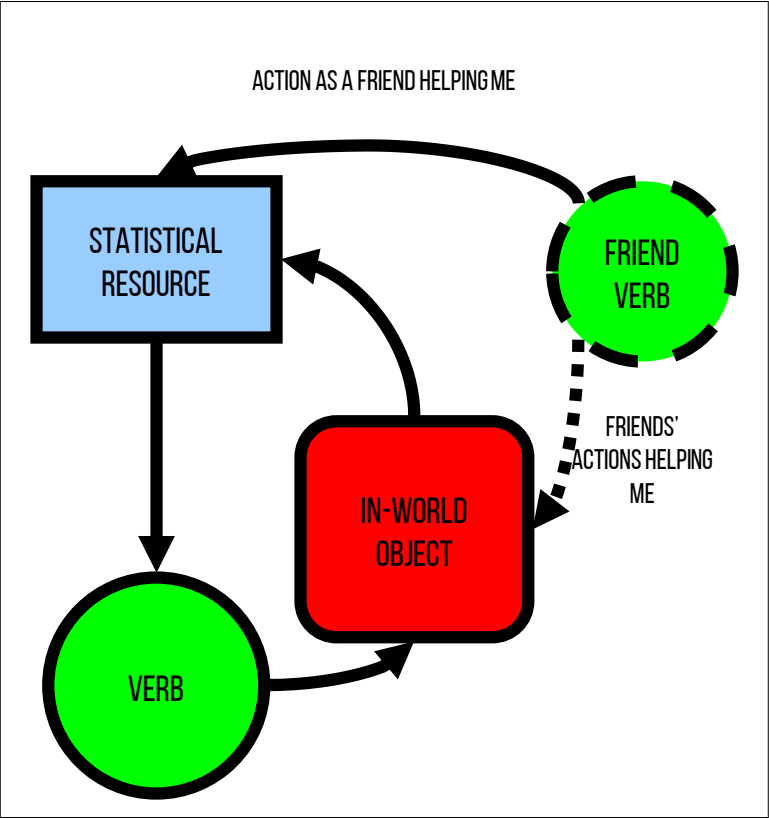
**FAILING TO UNDERSTAND
PROBABILITY**

TRAINING, VERTIGO

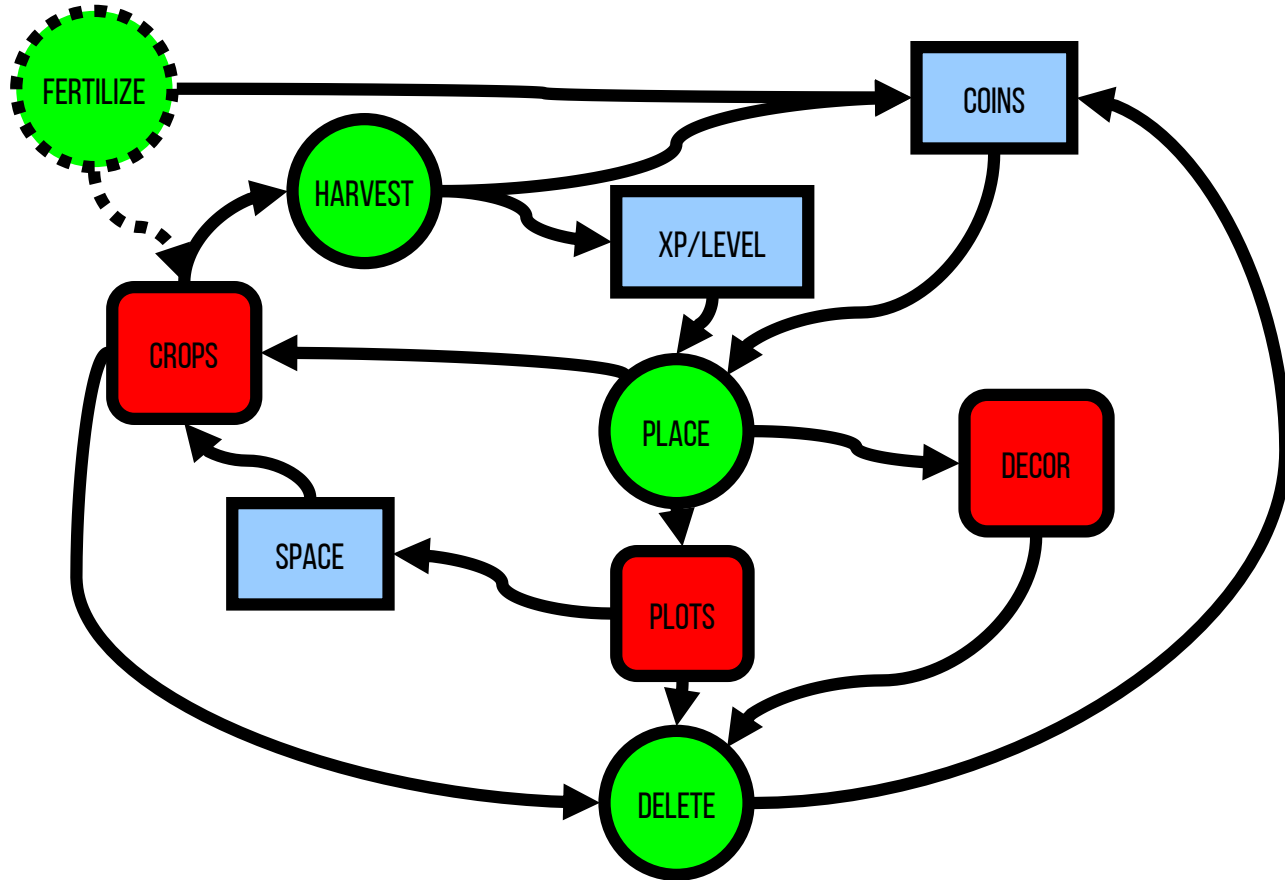
COMPLEX MATH

**MENTORING, HIERARCHY,
OTHERING, IDENTITY**

CHANGE

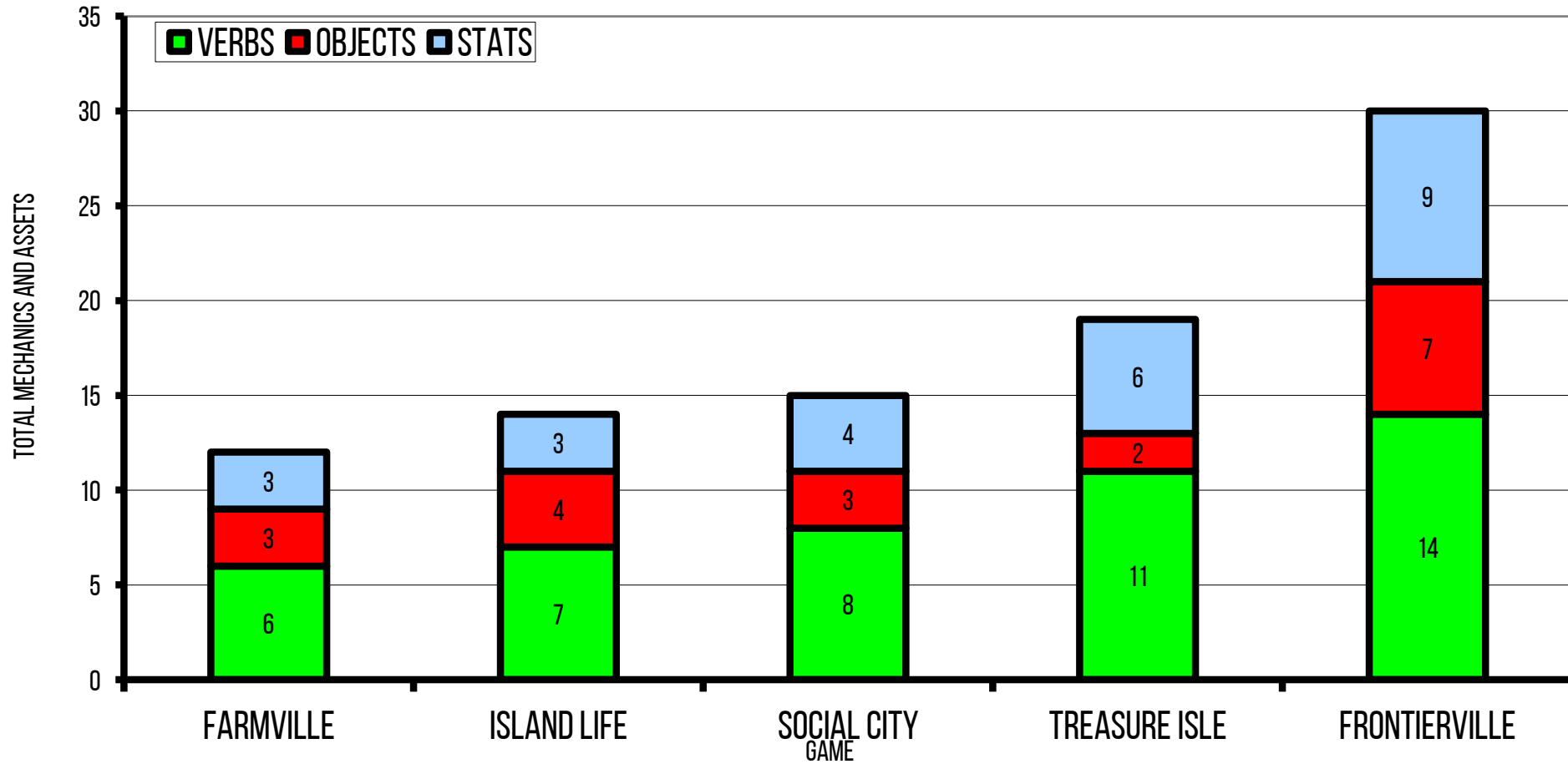


Farmville (original)



- VERBS: 3 (+3)
- OBJECTS: 3
- STATS: 3

SOCIAL GAME COMPLEXITY



1 V SELF/SYSTEM

- HELPING

1 V 1 PARALLEL

- STATUS
- RACES
- LEADERBOARDS
- TOURNAMENTS

1V1 OPPOSED

- FLOWER-PICKING
- DOT-EATING
- TUG OF WAR
- HANDICAPPING
- SECRETS

1 V 1 V 1 V ...

- LAST MAN STANDING
- BIDDING
- DECEPTION AND BLUFFING
- 3RD PARTY BETTING
- PRISONER'S DILEMMA
- GAMESMASTER

N V N (GROUPS)

- ROLES
- HOT POTATO
- RITUALS
- GIFTS
- RECIPROCITY
- MENTORING & TWINKING
- IDENTITY
- OSTRACISM

NETWORKS

- ITERATIVE INTERACTION & TRUST
- GUILDS
- EXCLUSIVITY
- GUILD VS GUILD
- TRADE AND CONTRACT
- ELECTIONS
- INFLUENCE AND FAME
- PUBLIC GOODS
- TRAGEDY OF THE COMMONS
- COMMUNITY
- STRATEGY GUIDES
- TEAMWORK (MLS)
- ARBITRAGE
- SUPPLY CHAINS
- USER GENERATED CONTENT

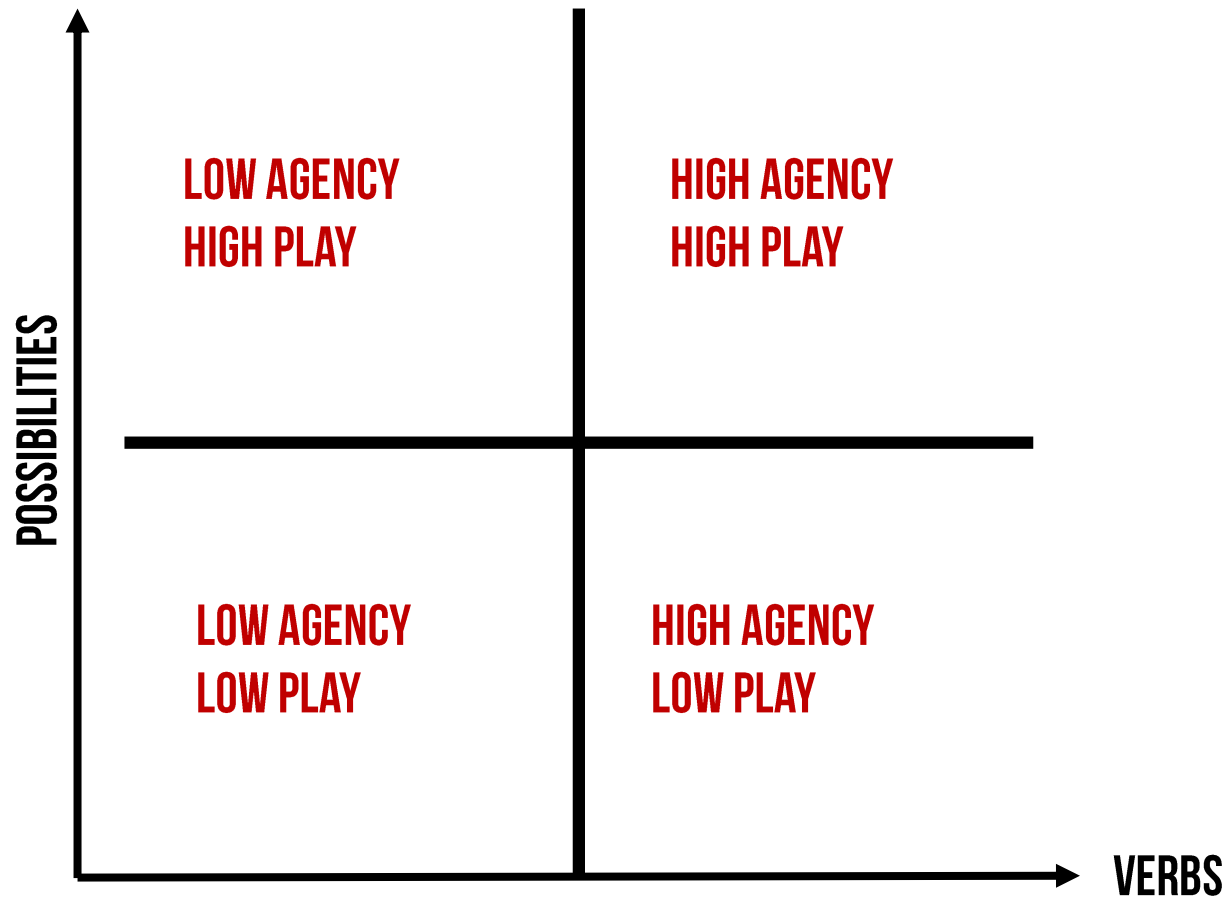
DECONSTRUCTION

- GRIEFING

“PASES”:

- POLITICS
- ART
- SCIENCE
- SOCIOLOGY
- ECONOMICS

(All this was premised on social graph analysis of MMO data starting around 2003)



- LOOSE SYMBOLIC RELATIONSHIPS
 - LAYERED SYMBOLOGY
 - AMBIGUITY OF REFERENTS
- ANACOENOSIS: ASKING AUDIENCE FOR OPINION, PRESENTING MULTIPLE OPINIONS
 - SURREALISM, ACAUSALITY

- NP PROBLEMS
- MULTIPLAYER
- ORTHOGONALITY (DISPARATE GAMES IN ONE)
 - SIMULATIONS
 - SIGNS AS TOKENS (RPGS, DIXIT)

- RHETORICAL REPETITION
- REPLAY FOR ACHIEVEMENTS
 - FRAMES, LABELS
- IMPOSE WORLDVIEW THRU VIEWPOINT CHARACTER
 - OTHERING
 - HIGH CAUSALITY

- STAGECRAFT: CUTSCENES, TRIGGERS, CONTROL
 - STRING OF PEARLS
 - SCAFFOLDING
- SPEED AND REFLEX TRAINING
- SELECTIVE AGENCY (NO CHOICES)
 - TROPES

Ludic Artifacts

Systems Designed For Play

- Go
- Magic: The Gathering
- Association football
- Werewolf
- Space Invaders
- League of Legends

Ludic Systems

Systems Susceptible To Play

- The stock market
- Musical instruments
- Warfare
- Politics
- The human inner ear
- Physics

Fun

Do you have to prepare for the challenge?	<i>Select loadout for an encounter</i>
...where prep includes prior moves?	<i>Tackle the trash mobs after the big boss</i>
...and you can prep in multiple ways?	<i>two different valid raid teams for a boss</i>
Does the topology of the space matter?	<i>layouts of the level matter</i>
...does the topology change?	<i>the enemy can block areas</i>
Is there a core verb for the challenge?	<i>A one-word verb like "defeat" or "intercept"</i>
...can it be modified by content?	<i>equipment affects the combat</i>
Can you use different abilities on it?	<i>aka, can you make choices, like say different attacks</i>
...will you have to in order to succeed?	<i>will mashing a single button fail, like in a fighting game</i>
Is there skill to using the ability?	<i>Using timing, or aim, or some other intrinsic player skill</i>
...or is this a basic UI action?	<i>Pressing "combine"</i>
Are there multiple success states?	<i>Hitting for a critical hit versus a normal one</i>
...with no bottomfeeding?	<i>You can't farm low level mobs</i>
...and a cost to failure?	<i>You can die or miss</i>

Delight

Does every action have affordances and feedback?	<i>The grappling indicators in Arkham Asylum; the cursor change on an interactive object; the click sound when clicked</i>
...where the feedback is contextual to the action?	<i>The sound for a door opening is different than the sound for dropping an item</i>
...and where it matches reality in action and reaction?	<i>The pulling of a trigger on the controller pulls a trigger in the game</i>
...and is tightly linked narratively?	<i>The feedback for an explosion looks like an explosion</i>
...and is multimedia?	<i>You get the sfx and the visual effect and maybe more</i>
Does it elicit instinctive reactions?	<i>Petville pets are instantly cute; Bioshock levels are instantly creepy; swords are instantly swingable</i>
...mix organic and artificial?	<i>Having both maximizes aesthetic appeal</i>
...can players affect it, even if only briefly?	<i>Ripples when walking in the water; knocking over barrels</i>
Are there surprises?	<i>Disturbing the butterflies in the grass in SWG; "Zug zug"</i>
...that are familiar or expected?	<i>bullet hole decals when you shoot; actually being able to eat that apple; the guitar riffs in Brutal Legend</i>
...that are grace notes?	<i>Flushing the toilet in Half Life 2</i>
Does it invite thought?	<i>Moral dilemmas (Bioshock), mysteries (Limbo)...</i>
...such as story-creation?	<i>The wisp language in UO</i>
...or philosophy?	<i>The rebuilding of the city in Flower</i>

Flow

Is the task complex in a mathematical sense?	<i>Solving for the right pick up group for a dungeon is a tough problem.. Look up NP-hard problems</i>
...where a simple heuristic can get you by at first anyway?	<i>"tank nuker healer" will get you by for a while but isn't optimal</i>
...is it fun?	<i>See all the items in the "fun" checklist</i>
Does the task have rising and falling pacing?	<i>You don't just fight bosses; there's "breathers" and periods of less challenge</i>
...where the ebb points rise over time?	<i>"easy" at higher levels of gameplay are equivalent to boss fights earlier on</i>
...and the peak points rise over time?	<i>Bosses get tougher over time</i>
...and ebbs are never boring?	<i>You never have a level where you can just kill everything without thinking about it</i>
...and peaks are never too hard?	<i>You never hit a spot where you're stopped cold or need a strategy guide (Ninja Gaiden bad, racing game compensation good).</i>
...and you know what the next goal is and how close?	<i>Waypoint systems; XP bars; etc</i>
Does the task have positive feedback?	<i>everything you should give feedback -- when you move, you can tell you are succeeding.</i>
...every ten seconds?	<i>Something needs to be giving you an update all the time</i>
...but variably?	<i>But not so regularly that it becomes ignorable; see Treasure Madness' rewards</i>
...is it delightful?	<i>See the Delight checklist</i>
Is the task chunk-driven after initial learning?	<i>After you master jumping in a platformer, it becomes second nature, and instead you are using the tool of jumping to solve higher order problems</i>
...and new tasks are only added after the previous is chunked?	<i>We don't make you learn jumping and shooting at the same time</i>
...and new tasks are not orthogonal?	<i>You layer shooting on top of jumping; they are complementary</i>

Social

Do you need other people?	<i>Viral mechanics; grouping; etc</i>
...because they contribute something unique?	<i>Teams; economic exchange</i>
...and you have a clear role?	<i>Classes, positions on a sports team</i>
...and you feel regularly needed by them?	<i>Interdependency, where you can enhance others' success</i>
...are there regular prompts for it?	<i>Neighbor prompts, or stuff in the mechanics that calls for help</i>
Do you have a rich growing profile?	<i>Character sheet, profile page</i>
...and you have clear relative status?	<i>Levels</i>
...and personalization?	<i>Equipment/clothing</i>
...and you can see other people's clearly?	<i>Dollhousing/decorating, avatars</i>
Does the activity promote regular rituals?	<i>Appointment gameplay; leveling up celebrations</i>
...that have pageantry?	<i>Levelling up visuals, graduation ceremonies</i>
...and public presence?	<i>Visible to others</i>
Does the activity promote altruism?	<i>Giftng, grouping, donation rooms, etc</i>
...and reciprocity?	<i>Social indebtedness: return gifts, etc</i>
...are there regular prompts for it?	<i>Nag screens, incentives</i>
...can you teach?	<i>Mentoring/sidekicking</i>
Does it promote tribality?	<i>Group membership like guilds</i>
...and is there membership in more than one?	<i>Class membership, guild+city+tag, etc</i>
...can you gloat?	<i>Taunt systems</i>

- And Chris Crawford's formalization of interactivity
- And Greg Costikyan's game structure (and his exploration of randomness)
- And Falstein's 400 Project
- And Clint Hocking's work
- And MDA
- And the collected work of the Looking Glass School
- And of the MUD-Dev school
- And the Habitat Papers
- Of course Richard Bartle's work which is way bigger than just player types
- And Dan Cook's skill atoms and conceptions of genre complexification
- And Nicole Lazzaro's formalism of Ekman microexpressions
- And Stephane Bura's emotion engineering
- And Dave Sirlin's Yomi and associated competitive game formalisms
- And Keith Burgun's formalism
- And Matt Worch's cultural theory approach on verbal, textual, and digital media
- And Mark Rosewater's work on rule-shifting possibility spaces
- And Elias, Garfield, Gutschera's *Characteristics* including concepts such as orthogames
- And Anthropy and Clark's alternate framework
- And Schell's lens-based framework
- And GNS theory
- And BoardGameGeek's ontology of mechanics
- And Mark Terrano's work on player experience graphing
- And Andrew McLennan's work on spatially mapping player confusion and game difficulty
- And...

What intellectual commitments are formalist game designers making?

- You tell me!

What intellectual commitments are
to most game designers making?

~~craft-centric~~

- That pragmatic heuristics and approximate yet replicable models are adequate for craft purposes.

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- That pragmatic heuristics and approximate yet replicable models are adequate for craft purposes.
- We don't want to be replaced by Steph Currybot designers because we kinda love our jobs.

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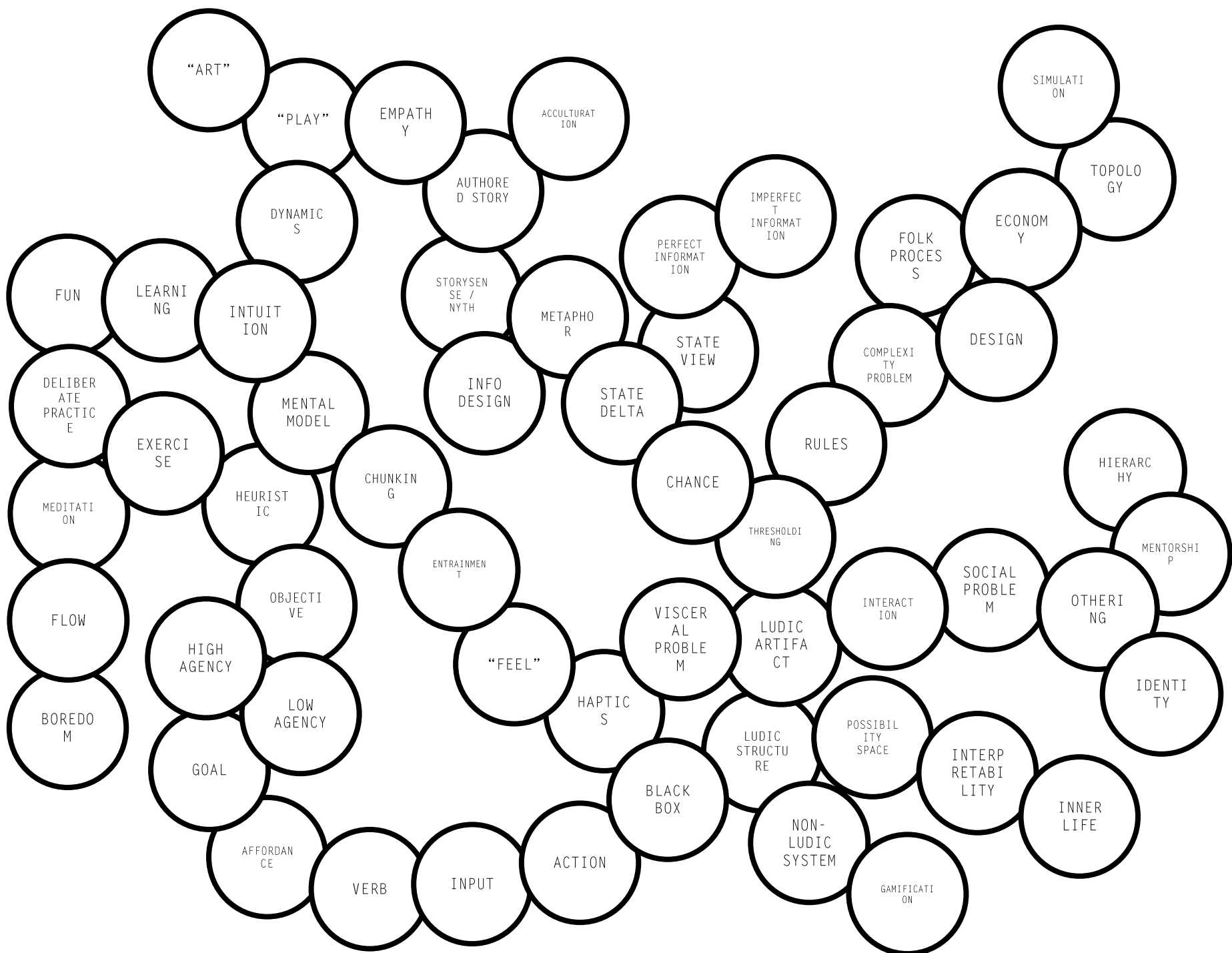
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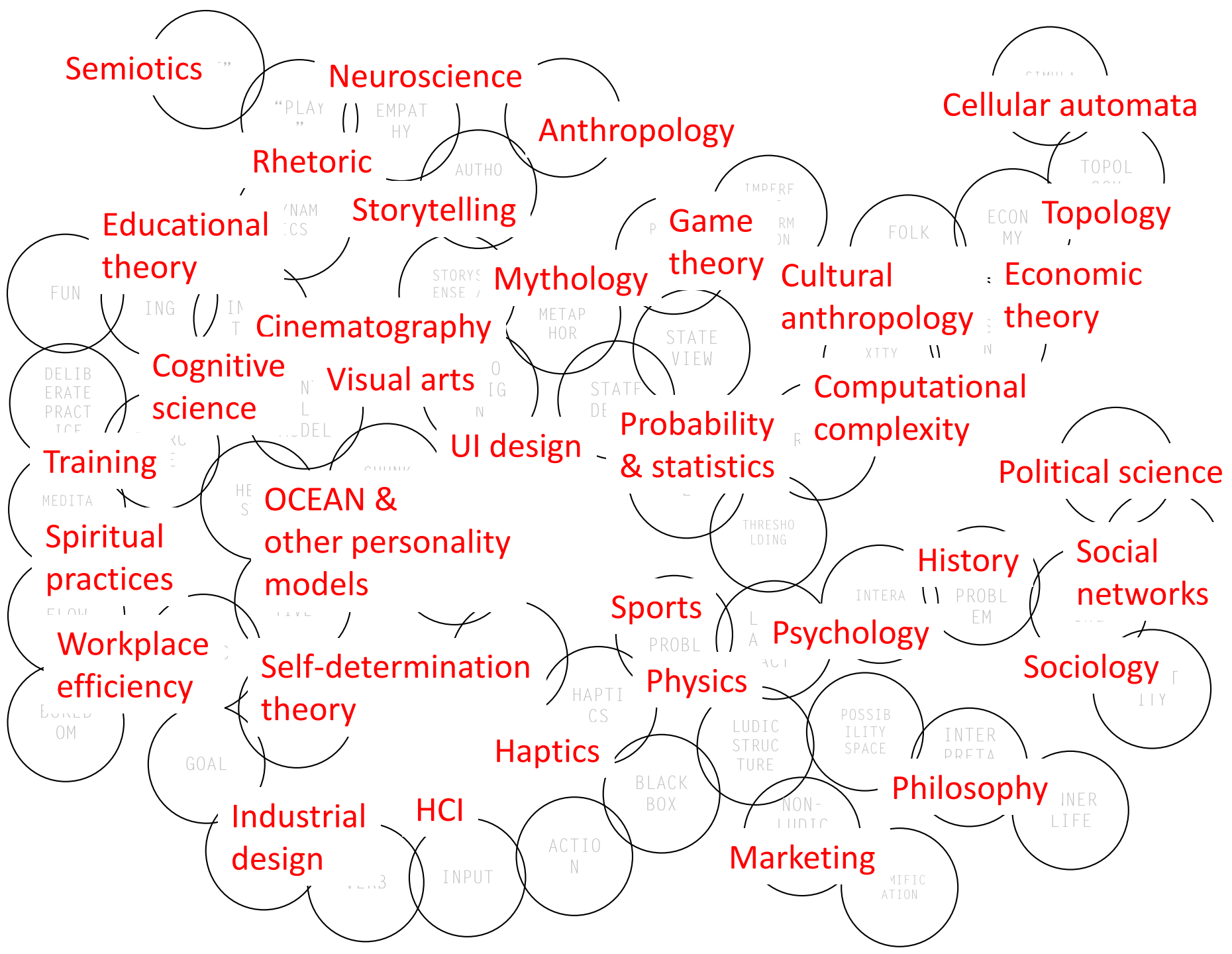
- That consilient structures exist for all fields and broad-based study yields access to higher-order approaches and creativity without traditional deep study thanks to serendipitous collision of contextual frameworks.

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- That consilient structures exist for all fields and broad-based study yields access to higher-order approaches and creativity without traditional deep study thanks to serendipitous collision of contextual frameworks.
- The Steph Curry designer is a dabbler and a polymath who thinks all this stuff is the same underneath.
- (We'll happily steal your ideas for the stew pot).





What intellectual commitments are to most game designers making?

~~craft-centric~~

To learn all that.

3/05] As the list was getting unwieldy, I have divided it into sections by topic.

[Art and Architecture](#) [7 suggestions]

[Business Strategy](#) [10 suggestions]

[Communities, Networks, and Cyberspace](#) [8 suggestions]

[Fiction](#) [10 suggestions]

[Filmmaking](#) [8 suggestions]

[Game Development and Industry History](#) [14 suggestions]

[History and Sociology](#) [10 suggestions]

[Marketing and Positioning](#) [16 suggestions]

[Miscellaneous](#) [7 suggestions]

[Psychology](#) [14 suggestions]

[Reference](#) [11 suggestions]

[Software Management and Team Leadership](#) [20 suggestions]

[User Interface and Usability](#) [5 suggestions]

[Writing and Storytelling](#) [9 suggestions]

(Game design retreats comparable to
this conference are **massively**
crossdisciplinary)

What are the biggest holes in our current understanding of formalist approaches to game design?

- The hole is persuading designers that there's any value at all!

What are the biggest holes in our current understanding of formalist approaches to game design?

- The hole is persuading designers that there's any value at all!
- I will take away from here cool concepts I only partly understand, and mangle them into brand new game designs.
- But most designers don't do that.

What are the biggest holes in our current understanding of formalist approaches to game design?

~~craft-centric~~

Perhaps a more relevant question for you...?

What are the biggest holes in our current understanding of formalist approaches to game design?

~~craft-centric~~

- Game design as subset of design: formalisms from architecture, urban planning, film, information design, narratology, color theory, sociology, anthropology, economics, I could probably type for another hour here.
- Education, training, and scaffolding.
- Game grammar style approaches, which have become the mental model for pretty much every game creation tool suite and are rapidly becoming endemic among practitioners.
- Urgent & overriding pragmatism.

What are the biggest holes in our current understanding of formalist approaches to game design?

~~craft-centric~~

- We need “Art History for Mathematicians.”

(and creative writing, and psychology, and linguistics, and and and...)

“If music is the art of sound, and architecture the art of space; if sculpture is the art of mass and painting the art of light; games may be the art of math.”

BUT

“I’ve started to wonder whether games make the world into clockwork. And whether this is *honest...* The challenge that I leave you with is whether or not games are *irredeemably* spreadsheets.”

The core game design skills

- **Be able to see the game with no hint of artwork, music, sound, anything** — the bare rules, bare mechanics, bare actions, stats, feedback loops. The skeleton, the core, the bone and sinew of it, without any dressing, as a shifting, moving mechanical construct of guy wires and rigid struts. It's not an attack, it's force projection, it's territory control in a graph. And you can see it in your head, and when a feature gets proposed, you can see where it slots in — or not, and know whether the whole construct will tip over.
- **Be able to see the game without any mechanics, any rules, any knowledge of how it should play** — to approach it as a user experience, the magical moment of immersion, the confusion, the dazzle and colors, the sheer sense of possibility and play. The skin, the surface, the way the music will swell when you step through that door, the way that moving will FEEL, the way the possibilities unfold. To know where someone would be confused, to know where they will be led, to see the whole construct as an innocent.

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- **And a great designer? They should be able to see both in their head at once.**

The ten (100?) year challenge

Model that?